



Docket No.: T2001-701819  
Old Docket No.: RMH 10969

B/ew

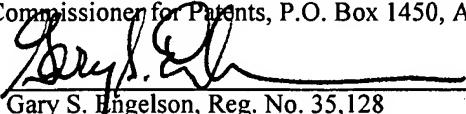
## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Roberto O. Pellizzari et al.  
Serial No: 10/665,914  
Confirmation No.: 7073  
Filed: September 19, 2003  
For: MACHINE SPRING DISPLACER FOR STIRLING CYCLE MACHINES  
Examiner: Richter, S.  
Art Unit: 3748

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### CERTIFICATE OF MAILING UNDER 37 CFR §1.8(a)

The undersigned hereby certifies that this document is being placed in the United States mail with first-class postage attached, addressed to Mail Stop Issue Fee, the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the 1st day of March 2006.

  
Gary S. Engelson, Reg. No. 35,128

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Mail Stop Issue Fee  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

### TRANSMITTAL

Sir:

Transmitted herewith are the following documents:

- Revocation Of Prior Powers Of Attorney and New Power Of Attorney
- Certificate Under 37 C.F.R. 3.73(b ) with copies of three assignments

If the enclosed papers are considered incomplete, the Mail Room and/or the Application Branch is respectfully requested to contact the undersigned at (617) 395-7000. A check is not enclosed. If a fee is required, the Commissioner is hereby authorized to charge Deposit Account No. 50/2762, ref. no. T2001-701919. A duplicate of this sheet is enclosed.

Respectfully submitted,  
*Roberto O. Pellizzari et al., Applicant*

  
Gary S. Engelson, Reg. No. 35,128  
LOWRIE, LANDO & ANASTASI, LLP  
Riverfront Office Park  
One Main Street  
Cambridge, MA 02142  
(617) 395-7000

Dated: March 1, 2006  
780848.1



New Docket No.: T2001-701819  
Old Docket No.: RMH 10969

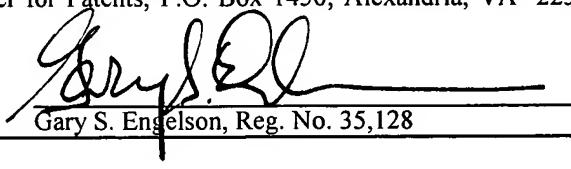
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: R. PELLIZZARI et al.  
Serial No: 10/665,914  
Conf. No.: 7073  
Filed: 09/19/2003  
For: MACHINE SPRING DISPLACER FOR STIRLING CYCLE MACHINES  
Examiner: RICHTER, S.  
Art Unit: 3748

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CERTIFICATE OF MAILING UNDER 37 CFR §1.8(a)

The undersigned hereby certifies that this document is being placed in the United States mail with first-class postage attached, addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the 1st day of March, 2006.



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Gary S. Engelson, Reg. No. 35,128

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Mail Stop ISSUE FEE  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

REVOCATION OF PRIOR POWERS OF ATTORNEY  
and  
NEW POWER OF ATTORNEY

The undersigned, TIAX LLC, assignee of the entire right, title and interest of the above-identified application, and in any divisional, continuing, substitute, renewal or reissue application(s) thereof, hereby revokes all powers of attorney previously given and appoints all practitioners of Lowrie, Lando & Anastasi, LLP associated with Customer Number:

37462

as assignee's attorneys or agents with full power of substitution to take any and all action necessary with regard to the identified patents and patent applications, and with regard to any divisional, continuing, substitute, renewal or reissue application(s) thereof:

Please address all telephone calls to Gary S. Engelson at telephone no. (617) 395-7000.

Please address all correspondence to the correspondence address associated with Customer Number:

37462

Please change the Attorney Docket Number to: T2001-701819.

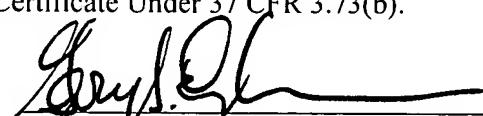
TIAX LLC

By: J. O'Leary  
Name: John O'Leary  
Title: PRESIDENT

ASSIGNEE CERTIFICATION

Attached to this power is a Certificate Under 37 CFR 3.73(b).

Dated: March 1, 2006



Gary S. Engelson, Reg. No. 35,128  
LOWRIE, LANDO & ANASTASI, LLP  
Riverfront Office Park  
One Main Street  
Cambridge, MA 02142  
(617) 395-7000

777575.1



## CERTIFICATE UNDER 37 CFR 3.73(b)

Applicant:	Roberto O. Pellizzari et al.	
Application/Patent No.:	10/665,914	Filed/Issued: September 19, 2003
Confirmation No.:	7073	
Entitled:	MACHINE SPRING DISPLACER FOR STIRLING CYCLE MACHINES	

TIAX LLC	, a	Delaware corporation
(Name of Assignee)	(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)	

certifies that it is the assignee of the entire right, title, and interest in the patent application/patent identified above by virtue of either:

- A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

OR

- B. [ X ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: Roberto O. Pellizzari et al.	To: TIAX LLC
A copy is attached.	
2. From: TIAX LLC	To: Chrysalis Technologies Incorporated
A copy is attached.	
3. From: Chrysalis Technologies Incorporated	To: Philip Morris USA Inc.

The document was recorded in the Patent and Trademark Office at

Reel 016846	Frame 0634
4. From: Philip Morris USA Inc.	To: TIAX LLC

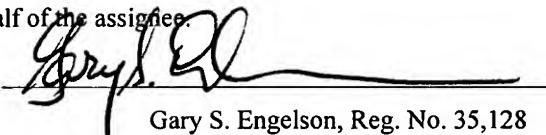
[ ] Additional documents in the chain of title are listed on a supplemental sheet.

- [ X ] Copies of assignments or other documents in the chain of title are attached.

The undersigned is authorized to act on behalf of the assignee.

March 1, 2006

Date

  
Gary S. Engelson, Reg. No. 35,128

**ASSIGNMENT NUNC PRO TUNC**

For good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, we, the undersigned Roberto O. Pellizzari of Groton, MA 01450, Laurence B. Penswick of Stevenson, WA 98648, and David Gedeon of Athens, OH 45701, hereby:

Sell, assign and transfer to **TIAX LLC**, a Delaware limited liability company having a place of business at 15 Acorn Park, Cambridge, MA 02140, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, *nunc pro tunc* January 4, 2004, the entire right, title and interest for the United States and all foreign countries, in and to any and all inventions which are disclosed in the application for United States Letters Patent filed in the United States Patent and Trademark Office on September 19, 2003 under Application Serial No. 10/665,914 and entitled **MACHINE SPRING DISPLACER FOR STIRLING CYCLE MACHINES**, and in and to said application and all divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent which have been or shall be filed in the United States and all foreign countries on any of said inventions; and in and to all original and reissued patents which have been or shall be issued in the United States and all foreign countries on said inventions including the right to apply for patent rights in each foreign country and all rights to priority; and further including any right to sue for past infringement;

Agree that said Assignee may apply for and receive Letters Patent for said inventions in its own name; and when requested, without charge to but at the expense of said Assignee, we agree to carry out in good faith the intent and purpose of this assignment, by executing all divisional, continuing, substitute, renewal, reissue, and all other patent applications on any and all said inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to said Assignee all facts known to us relating to said inventions and the history thereof, and generally by doing everything reasonably possible which said Assignee shall consider desirable for aiding in securing and maintaining proper patent protection for said inventions and for vesting title to said inventions and all applications for patents and all patents on said inventions, in said Assignee;

Request the Honorable Commissioner of Patents and Trademarks to issue said Letters Patent to said Assignee; and

Covenant with said Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by us and that full right to convey the same as herein expressed is possessed by us.

[Signature pages follow.]

---

Date Roberto O. Pellizzari

STATE OF \_\_\_\_\_:  
COUNTY OF \_\_\_\_\_:

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared Roberto O. Pellizzari, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

---

(SEAL) Printed Name of Notary Public  
My commission expires \_\_\_\_\_

---

Date Laurence B. Penswick

STATE OF \_\_\_\_\_:  
COUNTY OF \_\_\_\_\_:

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared Laurence B. Penswick, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

---

(SEAL) Printed Name of Notary Public  
My commission expires \_\_\_\_\_

20 January 2006

Date

David Gedeon

David Gedeon

STATE OF Ohio :  
COUNTY OF Athens :

On this 20<sup>th</sup> day of January, 2006 before me, the undersigned notary public, personally appeared David Gedeon, proved to me through satisfactory evidence of identification, which were David R. Gedeon, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.



**TONIA MARTIN**  
NOTARY PUBLIC, STATE OF OHIO  
MY COMMISSION EXPIRES 8/21/07  
COMMISSION RECORDED IN ATHENS COUNTY

Tonia Martin

Tonia Martin

Printed Name of Notary Public

My commission expires 8/21/2007

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**ASSIGNMENT NUNC PRO TUNC**

For good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, we, the undersigned **Roberto O. Pellizzari** of Groton, MA 01450, **Laurence B. Penswick** of Stevenson, WA 98648, and **David Gedeon** of Athens, OH 45701, hereby:

Sell, assign and transfer to **TIAX LLC**, a Delaware limited liability company having a place of business at 15 Acorn Park, Cambridge, MA 02140, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, *nunc pro tunc* January 4, 2004, the entire right, title and interest for the United States and all foreign countries, in and to any and all inventions which are disclosed in the application for United States Letters Patent filed in the United States Patent and Trademark Office on September 19, 2003 under Application Serial No. 10/665,914 and entitled **MACHINE SPRING DISPLACER FOR STIRLING CYCLE MACHINES**, and in and to said application and all divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent which have been or shall be filed in the United States and all foreign countries on any of said inventions; and in and to all original and reissued patents which have been or shall be issued in the United States and all foreign countries on said inventions including the right to apply for patent rights in each foreign country and all rights to priority; and further including any right to sue for past infringement;

Agree that said Assignee may apply for and receive Letters Patent for said inventions in its own name; and when requested, without charge to but at the expense of said Assignee, we agree to carry out in good faith the intent and purpose of this assignment, by executing all divisional, continuing, substitute, renewal, reissue, and all other patent applications on any and all said inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to said Assignee all facts known to us relating to said inventions and the history thereof, and generally by doing everything reasonably possible which said Assignee shall consider desirable for aiding in securing and maintaining proper patent protection for said inventions and for vesting title to said inventions and all applications for patents and all patents on said inventions, in said Assignee;

Request the Honorable Commissioner of Patents and Trademarks to issue said Letters Patent to said Assignee; and

Covenant with said Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by us and that full right to convey the same as herein expressed is possessed by us.

[Signature pages follow.]

2/7/2006

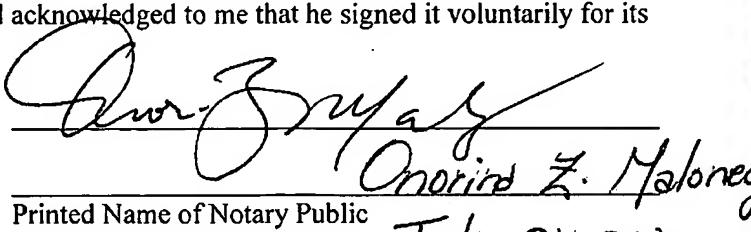
  
Roberto O. Pellizzari

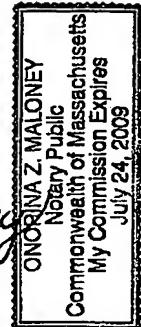
Date

STATE OF \_\_\_\_\_:  
COUNTY OF \_\_\_\_\_:

On this 7<sup>th</sup> day of February, 2006 before me, the undersigned notary public, personally appeared Roberto O. Pellizzari, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

(SEAL)

  
Printed Name of Notary Public  
My commission expires



Date

Laurence B. Penswick

STATE OF \_\_\_\_\_:  
COUNTY OF \_\_\_\_\_:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared Laurence B. Penswick, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

(SEAL)

  
Printed Name of Notary Public  
My commission expires \_\_\_\_\_

---

Date

David Gedeon

STATE OF \_\_\_\_\_:  
COUNTY OF \_\_\_\_\_:

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared David Gedeon, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

---

(SEAL)

Printed Name of Notary Public  
My commission expires \_\_\_\_\_

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**ASSIGNMENT NUNC PRO TUNC**

For good and valuable consideration, the sufficiency and receipt of which is hereby acknowledged, we, the undersigned Roberto O. Pellizzari of Groton, MA 01450, Laurence B. Penswick of Stevenson, WA 98648, and David Gedeon of Athens, OH 45701, hereby:

Sell, assign and transfer to **TIAX LLC**, a Delaware limited liability company having a place of business at 15 Acorn Park, Cambridge, MA 02140, its successors, assigns and legal representatives, all hereinafter referred to as the Assignee, *nunc pro tunc* January 4, 2004, the entire right, title and interest for the United States and all foreign countries, in and to any and all inventions which are disclosed in the application for United States Letters Patent filed in the United States Patent and Trademark Office on September 19, 2003 under Application Serial No. 10/665,914 and entitled **MACHINE SPRING DISPLACER FOR STIRLING CYCLE MACHINES**, and in and to said application and all divisional, continuing, substitute, renewal, reissue and all other applications for Letters Patent which have been or shall be filed in the United States and all foreign countries on any of said inventions; and in and to all original and reissued patents which have been or shall be issued in the United States and all foreign countries on said inventions including the right to apply for patent rights in each foreign country and all rights to priority; and further including any right to sue for past infringement;

Agree that said Assignee may apply for and receive Letters Patent for said inventions in its own name; and when requested, without charge to but at the expense of said Assignee, we agree to carry out in good faith the intent and purpose of this assignment, by executing all divisional, continuing, substitute, renewal, reissue, and all other patent applications on any and all said inventions, by executing all rightful oaths, assignments, powers of attorney and other papers, by communicating to said Assignee all facts known to us relating to said inventions and the history thereof, and generally by doing everything reasonably possible which said Assignee shall consider desirable for aiding in securing and maintaining proper patent protection for said inventions and for vesting title to said inventions and all applications for patents and all patents on said inventions, in said Assignee;

Request the Honorable Commissioner of Patents and Trademarks to issue said Letters Patent to said Assignee; and

Covenant with said Assignee that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been made to others by us and that full right to convey the same as herein expressed is possessed by us.

[Signature pages follow.]

Date

Roberto O. Pellizzari

STATE OF \_\_\_\_\_:  
COUNTY OF \_\_\_\_\_:

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, before me, the undersigned notary public, personally appeared Roberto O. Pellizzari, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

(SEAL)

Printed Name of Notary Public  
My commission expires \_\_\_\_\_

Date

Laurence B. Penswick

STATE OF Washington:  
COUNTY OF Skamania:

On this 22<sup>nd</sup> day of February, 2006, before me, the undersigned notary public, personally appeared Laurence B. Penswick, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

(SEAL)

Printed Name of Notary Public

My commission expires 4/15/09

GERRI A. WEBER  
NOTARY PUBLIC  
STATE OF WASHINGTON  
COMMISSION EXPIRES  
APRIL 15, 2009

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Date

David Gedeon

STATE OF \_\_\_\_\_:  
COUNTY OF \_\_\_\_\_:

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared David Gedeon, proved to me through satisfactory evidence of identification, which were \_\_\_\_\_, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

---

(SEAL)

Printed Name of Notary Public  
My commission expires \_\_\_\_\_

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**ASSIGNMENT *NUNC PRO TUNC***

Whereas, TIAX LLC having a place of business at 15 Acorn Park, Cambridge, MA 02140 (ASSIGNOR) is the owner of the entire right, title and interest in and to the following application and in and to all inventions which are disclosed therein:

Application No.	Date of Filing or Grant
10/665,914	September 19, 2003

Whereas, Chrysalis Technologies Incorporated, then having a place of business at 7801 Whitepine Road, Richmond, VA 23237 (ASSIGNEE) then desired to acquire all rights in said application, any inventions disclosed therein, and any and all patent(s) of the United States and of all other countries which may be granted for the said inventions;

Now therefore, for good and valuable consideration, the sufficiency of which is acknowledged and the receipt of which is hereby acknowledged, ASSIGNOR does hereby sell, assign and transfer to the said ASSIGNEE, *nunc pro tunc* August 31, 2004, the entire right, title and interest in and to the said application, and all inventions therein disclosed and any and all patents of the United States and of all other countries which may be granted for the said inventions.

Said ASSIGNEE, its successors and assigns, shall have, hold and enjoy the said application, invention(s) and any and all patent(s) of the United States and of all other countries which may be granted for the said inventions, to its own use and benefit as fully and entirely as the same would have been held and enjoyed had this assignment and sale not been made, including any right to sue for past infringement.

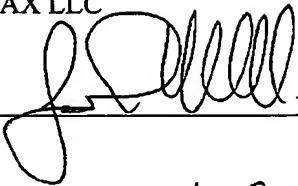
ASSIGNOR hereby authorizes and requests each respective Patent and Trademark Office to issue any Patent as may be granted on the said inventions to the said Assignee in accordance with the terms of this instrument.

[Signature page follows.]

TIAX LLC

Date: 19 Jan. 2006

By:



John M. Collins

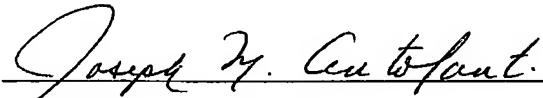
Printed name of person signing

PRESIDENT

Printed title of person signing

COMMONWEALTH OF MASSACHUSETTS:  
COUNTY OF MIDDLESEX:

On this 19<sup>th</sup> day of JANUARY, 2006, before me, the undersigned notary public, personally appeared JOHN H. COLLINS, proved to me through satisfactory evidence of identification, which were PERSONAL KNOWLEDGE, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.



Joseph M. Centofanti

Printed Name of Notary Public

My commission expires JUNE 19 2009

(SEAL)

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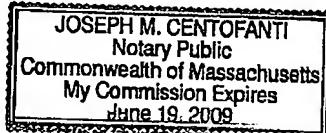


EXHIBIT C

ASSIGNMENT OF PATENTS AND PATENT APPLICATIONS

WHEREAS, Philip Morris USA Inc., a Virginia corporation with offices at 6601 West Broad Street, Richmond, Virginia 23230-1701 ("PM USA"), is the owner of the patents and the patent applications identified on Schedule A attached hereto and the inventions disclosed and claimed therein; and

WHEREAS, TIAX LLC, a Delaware limited liability company with offices at 15 Acorn Park, Cambridge, Massachusetts 02140 ("TIAX"), desires to acquire said patents, patent applications and the inventions disclosed and claimed therein;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, PM USA does hereby assign, sell and transfer unto TIAX all right, title and interest in and to the said patents and patent applications identified on Schedule A and the inventions disclosed and claimed therein, together with the right to sue and recover for, and the right to profits or damages due or accrued arising out of or in connection with, any and all past, present or future infringements of said patents, patent applications (and any patent(s) issuing with respect thereto) or inventions.

IN WITNESS WHEREOF, PM USA by its duly authorized officer has executed this assignment, as an instrument under seal to be effective the 2 day of Dec., 2005.

PHILIP MORRIS USA INC.

By:

Name: Roy K. Anise

Title: Vice President and General Manager

STATE OF Virginia )  
                      )  
                      ) ss.  
COUNTY OF Richmond)

On this the 2 day of Dec., 2005 before me appeared Roy K. Anise, the person who signed this instrument, who acknowledged that s/he is a officer of Philip Morris USA Inc. and that s/he signed such instrument as a free act on behalf of Philip Morris USA Inc.

Margaret J. Hartman  
Notary Public

My Commission expires: 5/31/08

**SCHEDULE A TO ASSIGNMENT OF PATENTS AND PATENT APPLICATIONS**

Docket No.	Application No.	Country	Filing Date	Title	Status
F009	10/883,393	US	7/1/2004 (Provisional filed 7/2/2003)	Free Piston Stirling Engine Control	Published
F009 PCT	PCT/US/04/21289	WO	7/1/2004	Free Piston Stirling Engine Control	Published
F009 TW	093120115	TW	7/2/2004	Free Piston Stirling Engine Control	Pending
F024	10/883,310	US	7/1/2004 (Provisional filed 7/1/2003)	Impingement Heat Exchanger for Generating Power	Published
F024 PCT	PCT/US/04/21290	WO	7/1/2004	Impingement Heat Exchanger for Generating Power	Published
F024 TW	093119925	TW	7/1/2004	Impingement Heat Exchanger for Generating Power	Pending
F025	10/883,390	US	7/1/2004 (Provisional filed 7/1/2003)	Capacitive Position Sensor and Sensing Methodology	Published
F025 PCT	PCT/US/04/21287	WO	7/1/2004	Capacitive Position Sensor and Sensing Methodology	Published

Docket No.	Application No.	Country	Filing Date	Title	Status
F025 TW	093120115	TW	7/1/2004	Capacitive Position Sensor and Sensing Methodology	Pending
F026	10/883,511	US	7/1/2004 (Provisional filed 7/1/2003)	Recuperator and Combustor for Use in External Combustion Engines	Published
F026 PCT	PCT/US/04/21288	WO	7/1/2004	Recuperator and Combustor for Use in External Combustion Engines	Published
F026 TW	093120011	TW	7/1/2004	Recuperator and Combustor for Use in External Combustion Engines	Pending
F029	10/943,545	US	9/17/2004 (Provisional filed 9/17/2003)	Threaded Sealing Flange for Use in an External Combustion Engine	Published
F029 PCT	PCT/US/04/30479	WO	9/17/2004	Threaded Sealing Flange for Use in an External Combustion Engine	Pending

Docket No.	Application No.	Country	Filing Date	Title	Status
F029 TW	093128400	TW	9/19/2004	Threaded Sealing Flange for Use in an External Combustion Engine	Pending
F030	10/665,914	US	9/19/2003	Machined Spring Displacer for Stirling Cycle Engines	Published
F030 PCT	PCT/US/04/30481	WO	9/17/2004	Machined Spring Displacer for Stirling Cycle Engines	Pending
F030 TW	093128392	TW	9/17/2004	Machined Spring Displacer for Stirling Cycle Engines	Pending
F033	10/920,474	US	8/18/2004	Fluid Displacement Pump	Pending
F033 PCT	TBD	WO	8/18/2005	Fluid Displacement Pump	Pending
F033 MY	TBD	MY	8/18/2005	Fluid Displacement Pump	Pending
F033 TH	TBD	TH	8/18/2005	Fluid Displacement Pump	Pending
F033 TW	TBD	TW	8/18/2005	Fluid Displacement Pump	Pending